Low-Cost Silicon Solar Array Project (LSSA)
Administrative Documents Collection, 1974-1979
0.6 cubic feet
JPL 17

History

The Low-Cost Silicon Solar Array Program (LSSA), which was later called the Low-Cost Solar Array (LSA) Project), and finally called the Flat-Plate Solar Array (FSA) Project, was managed by the Jet Propulsion Laboratory (JPL). LSSA was one part of the National Photovoltaics (PV) Program that supported photovoltaic technology research. LSSA was developed, sponsored, and sustained by the National Science Foundation (NSF), the U.S. Department of Energy (DOE) and its predecessor, the Energy Research and Development Administration (ERDA) as a means of developing alternative sources of energy. Alternative energy sources had risen to a level of national interest as a result of the energy crisis and oil embargoes of the early-1970s.

Concepts for United States energy independence through alternative sources of energy had been explored at the 1973 Conference on Photovoltaic Conversion of Solar Energy for Terrestrial Applications, at Cherry Hill, New Jersey, sponsored by the National Science Foundation. The conference's recommendations and conclusions were used in developing the National Photovoltaics Program. A result of the United States Federal Government's willing interest in PV technology and the Cherry Hill Conference was the LSSA Project, which was one effort to explore alternate sources of energy, in order to make the United States energy independent.

LSSA lasted eleven (11) years, from 1975 to 1986. The LSSA Project was funded to a level of almost $235 million ($148 million adjusted to 1974 dollars), and involved 256 research and development (R&D) contracts at 103 United States companies and educational institutions.

The LSSA Project was based on the same crystalline silicon technology that had been developed for the United States Space Program. The costs of this technology were still high in 1975, and the government hoped to reduce the manufacturing costs of solar cells through its LSSA R&D program.

DOE's predecessor, ERDA, had asked the Jet Propulsion Laboratory, to implement the LSSA Project. The government hoped that through the LSSA Project it could help develop an infrastructure that would allow an infant industry to survive, ultimately reducing the cost of PV power generation to the point where it would be competitive with conventional fossil-fuel-based power generation. A strategy was developed to involve as many members of the fledgling PV industry as possible to give it both momentum and credibility.

The LSSA Project's goals were revised in 1977 to reflect changing capacities and deadlines. As a result, the project name was changed in 1978 to Low-Cost Solar Array (LSA) Project in order to indicate that photovoltaic materials other than silicon were to be included within the scope of the Project's responsibilities. Over the eleven-year course of the Project, major changes in national policy within the DOE, shifting government objectives, and changes in the prices and availability of energy sources required constant adjustments to the Project and its goals. That is why, in 1981, the Project name again was changed, this time to the Flat-Plate Solar Array (FSA) Project. Commercial and technical readiness, originally planned for 1982 was rescheduled to 1986.

The JPL approach to the project was similar in organization to JPL flight projects, and the original organization of the LSSA Project followed the technical partitioning of the work effort around the five goals. Responsible JPL individuals included R. G. Forney, Manager of LSSA at JPL, Dr. Marshall E. Alper, Manager of the Solar Energy Program, and John V. Goldsmith, Manager of Technology Development at JPL. The technical organization areas, each with a manager, were:

(1) Silicon materials refinement;
(2) Single-crystal silicon sheet formation;

(3) Automated Photovoltaic array assembly;
(4) Module encapsulation;
(5) Large-scale production

To achieve these goals, Research and Development was organized into seven Task Areas, those being: 1) Silicon Material Task; 2) Silicon Sheet Task; 3) High-Efficiency Solar Cells Task; 4) Process Development; 5) Reliability Engineering Task; 6) Module Encapsulation Task; and 7) Project Analysis and Integration.

Work on the project was performed by a number of subcontractors for Jet Propulsion Laboratory under JPL contracts, approved by agreement between NASA and the Department of Energy.

The objective of the JPL LSSA Project was to focus on the development and ultimate commercial production of flat plate, non-concentrating silicon solar arrays. The goal-oriented research and development activity was concerned not only with array technology, but also with the production of technology required to manufacture the arrays. The arrays would be produced at a price and in a quantity that would make them attractive as an alternate source of a significant fraction of the country's future energy requirements.

Several large photovoltaic installations resulted from the Project. ARCO Solar has installed central-station PV power plants in California, one at the Lugo Substation near Hesperia and another in Carissa Plains. Each plant has operated successfully, providing electricity to Southern California Edison Company and the Pacific Gas and Electric Company, respectively. Union Carbide also built a large-scale plant.

This collection contains administrative correspondence, memoranda, status reports, schedules, and other documents having to do with the day-to-day activities of the contractors and JPL employees involved in the project. Also included in the correspondence are several letters to Senator Charles H. Percy, a list of questions from Senator Albert Gore, Jr., as well as correspondence with other congressional committee members. A unique aspect of this project is the material pertaining to the congressional hearings that took place in 1977.

Although the PV technologies developed by the LSSA Project have been considered successful, their application commercially has not been as extensive as imagined. The lack of utilization is not because of technological reasons, but because prices, availability, and other factors related to the fossil fuel market have changed. Since the program was implemented in 1975, fossil fuel energy prices have fallen substantially and supplies have been abundant, reducing the economic competitiveness of photovoltaic energy. There is no guarantee that this will continue to be the case, or that government policies will not change.

The Flat Plate Solar Array (FSA) Project was phased out at the end of September 1986.

Provenance

The Archives received this collection on March 26, 1990 as Accession 90-12 from Robert G. Forney, Section 800, Office of Technology and Application Programs.

Collection Arrangement and Description

The collection is arranged by subject, and thereunder chronologically.

Conservation/Preservation

Standard preparations were made for long term storage of documents.

Restrictions

The collection contains three Procurement Plans in Folder 7 marked "Sensitive Information."

Separation Statement

No elements of the collection were separated.

Finding Aids

Register available in the repository.

File Folder List

BOX 1

Fld 1 Correspondence, Outgoing from Jet Propulsion Laboratory, June 1975-September 1978

Fld 2 Correspondence, Incoming to Jet Propulsion Laboratory, August 1975-December 1976

Fld 3 Meeting Agenda for LSSA Design Team and Project Managers' Meetings, with related Interoffice Memoranda and Correspondence, April 1975-September 1978

Fld 4 Minutes of various team and committee meetings, July 1975-May 1977

Fld 5 Correspondence related to LSSA Request for Proposal, July 1975-November 1978

Fld 6 Project Requirements and Schedules, 1 of 3 folders, September 1976-February 1977

Fld 7 Project Requirements and Schedules, 2 of 3 folders, March 1977-March 1978

Fld 8 Project Requirements and Schedules, 3 of 3 folders, March 1978-October 1978

Fld 9 Congressional Hearing Reports, April 1976-December 1978

Fld 10 Copies of Viewgraph Presentations, May 1977-September 1978

BOX 2

Fld 11 Photovoltaic Reports, Reviews, Plans, Proposals, and related correspondence 1 of 3 folders, April 1975-November 1977

Fld 12 Photovoltaic Reports, Reviews, Plans, Proposals, and related correspondence, 2 of 3 folders, December 1977-September 1978

Fld 13 Photovoltaic Reports, Reviews, Plans, Proposals, and related correspondence, 3 of 3 folders, October 1978-December 1978

Fld 14 Weekly Significant Events, including some Monthly Status Reports, 1 of 2 folders, January 1977-February 1978

Fld 15 Weekly Significant Events, 2 of 2 folders, February-July 1978

Fld 16 Procurement Status Reports, May 1976-February 1977

Fld 17 Budget Reports, 1 of 3 folders, June 1975-February 1977

Fld 18 Budget Reports, 2 of 3 folders, February 1977-February 1978

Fld 19 Budget Reports, 3 of 3 folders, March-November 1978

CATALOG DESCRIPTION

Low-Cost Silicon Solar Array Project (LSSA) Administrative Correspondence Documents Collection, 1974-1979.

0.6 cubic ft. in 19 folders.

The Low-Cost Silicon Solar Array (LSSA) Project was a research and development project with the objective of focusing on the development and ultimate commercial production of flat plate, non-concentrating silicon solar arrays. The project was a goal-oriented research and development activity concerned not only with array technology, but also with the production of technology required to produce the arrays at a price and in a quantity which would make them attractive as an alternate source of a significant fraction of the country's future energy requirements. The project formed part of the National Photovoltaics (PV) Program, and was sponsored by the United States Department of Energy and its predecessor, the Energy Research and Development Administration.

This collection of LSSA Project records contains administrative correspondence and planning documents, presentation materials, project plans, performance requirements, timelines, milestone schedules, budgets, procurement plans, as well as memoranda, status reports, and other documents having to do with the day-to-day activities of the government agencies, contractors, and JPL employees involved in the project. Much of the correspondence is between R. G. Forney, Manager of the LSSA Project at the Jet Propulsion Laboratory (JPL), and two officials at the Energy Research and Development Administration (ERDA) in Washington, D.C. Those two officials were Dr. Leonard M. Magid, Office of Solar Electric Application at ERDA, and Dr. Morton B. Prince, Chief, Photovoltaic Branch, Office of Solar Electric Application, Division of Solar Energy at ERDA. Also included in the correspondence are several letters to Senator Charles H. Percy and a list of questions from Senator Albert Gore, Jr.

A unique aspect of this project is material pertaining to the congressional hearings that took place in 1977.

Tracings

Alper, Marshall E.
Goldsmith, John V.
Magid, Leonard M.
Prince, Morton B.
Low-Cost Solar Array Project
Flat-Plate Solar Array Project
Jet Propulsion Laboratory (U.S.). Low-Cost Silicon Solar Array Project.
Jet Propulsion Laboratory (U.S.). Low-Cost Solar Array Project.
Jet Propulsion Laboratory (U.S.). Flat-Plate Solar Array Project.
National Photovoltaics Program.
National Science Foundation.
Energy development--United States--Research.

Solar energy--United States--Research.
Silicon crystals--Research.
Photovoltaic power generation--United States--Passive systems--Research.
Research and development contracts, Government--United States.
SOLAR ENERGY CONVERSION
PHOTOVOLTAIC CONVERSION
SOLAR ARRAYS
SOLAR CELLS
PHOTOVOLTAIC CELLS
SILICON COMPOUNDS